U.S. Department of Transportation
Federal Aviation Administration

Advisory Circular

Subject: DISPATCH RESOURCE MANAGEMENT TRAINING

Date: 2/7/95 **AC No:** 121-32
Initiated by: AFS-210 **Change:**

1. PURPOSE. This advisory circular (AC) complements guidance already developed for flightcrew members and other groups with respect to training in resource management. Focus is on the aircraft dispatcher whose traditional role in air carrier operations is being changed by fundamental changes in aviation, notably advanced technology.

2. RELATED FAR SECTIONS.

a. Part 65, Subpart C - Aircraft Dispatchers.

b. Part 65, Appendix A - Aircraft Dispatcher Courses.

c. Part 121, Subpart E - Approval of Routes: Domestic and Flag Air Carriers, Section 121.107.

d. Part 121, Subpart M - Airman and Crewmember Requirements, Section 121.395.

e. Part 121, Subpart N - Training Program, Sections 121.415, 121.418, and 121.422.

f. Part 121, Subpart P - Aircraft Dispatcher Qualifications and Duty Time Limitations: Domestic and Flag Air Carriers, Section 121.463.

g. Part 121, Subpart T - Flight Operations, Sections 121.533-537.

h. Part 121, Subpart U - Dispatching and Flight Release Rules.

i. Special Federal Aviation Regulation (SFAR) No. 58, Advanced Qualification Program.

3. RELATED READING MATERIAL.

a. AC 120-51B, Crew Resource Management Training.

b. AC 120-35B, Line Operational Simulations: Line-Oriented Flight Training, Special Purpose Operational Training, Line Operational Evaluation.

c. AC 120-54, Advanced Qualification Program.

NOTE: These AC's may be obtained from:

Department of Transportation
Property Use and Storage Section, M-45.3
Washington, DC 20590

d. For detailed information on the recommendations made in AC 120-51B, the reader is encouraged to review "Crew Resource Management: An Introductory Handbook," published by the Federal Aviation Administration (FAA) (Document No. DOT/FAA/RD-92/26). Additional background material can be found in "Cockpit Resource Management Training: Proceedings of a NASA/MAC Workshop," 1987. The National Aeronautics and Space Administration (NASA) Conference Proceedings number is 2455. "The National Plan for Aviation Human Factors" defines research issues related to crew coordination and training. Copies of the preceding publications may be purchased from the National Technical Information Service, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, Virginia 22161, (703) 487-4650.

e. Description of current research findings, methodological issues, and organizational experience can be found in Helmreich, R.L., and Wilhelm, J.A., (1991) "Outcomes of CRM Training," International Journal of Aviation Psychology, 1, 287-300; in Helmreich, R.L., and Foushee, H.C., "Why Crew Resource Management: Empirical and Theoretical Bases of Human Factors Training in Aviation;" in Orasanu, J., "Decisionmaking in the Cockpit;" and in Gregorich, S.E., and Wilhelm, J.A., "Crew Resource Management Training Assessment." Each of the preceding appears as a chapter in Wiener, E.L., Kanki, B.G. and Helmreich, R.L., Cockpit Resource Management, 1993, Academic Press, Orlando, Florida.

f. National Transportation Safety Board (NTSB) AAR-91-04; Final report of the Commission of Inquiry into the Air Ontario Accident at Dryden, Ontario, March 10, 1989.

4. BACKGROUND. The NTSB and the Transportation Safety Board of Canada have both found that inadequate operational control and inadequate collaborative decisionmaking have been contributing factors in air carrier accidents. Effective management of available resources by aircraft dispatchers is one essential deterrent to such accidents. In exercising operational control, the dispatcher coordinates with flightcrew members, air traffic controllers (ATC), and other members of a vast team in order to meet the requirements of daily flight operations. This AC encourages the dispatcher's knowledge of the functions of the other participants throughout the operating environment. Two expected benefits to the dispatcher are (1) better handling of information that bears on safe flight operations and (2) a better interface with each pilot in command, consistent with the joint responsibility concept outlined in FAR Part 121.

5. DEFINITIONS.

a. Human Factors. Human factors entails a multidisciplinary effort to generate and compile information about human capabilities and limitations and to apply that information to equipment, systems, facilities, procedures, jobs, environments, training, staffing, and personnel management for safe, comfortable, effective human performance.

NOTE: It is recognized that inadequate system design or inadequate operator training can contribute to individual human error that leads to system performance degradation. Further, it is recognized that inadequate design and management of crew tasks can contribute to group errors that lead to system performance degradation.

b. Dispatch Resource Management (DRM). The communication center with respect to positive operational control is the dispatcher who coordinates a wide array of resources for the flightcrew. DRM addresses the challenge of optimizing the person/machine interface and related interpersonal issues. These issues include effective teambuilding and maintenance, information transfer, problem solving, decisionmaking, maintaining situational awareness, and dealing with automated systems. DRM training, like CRM training, is comprised of three components: Initial Indoctrination/Awareness, Recurrent Practice and Feedback, and Continuing Reinforcement. DRM differs in the effective use of all resources: human resources, hardware, and information.

c. Operational Control. The authority over initiating, conducting, or terminating a flight.

d. Crew Resource Management Training. Training in aviation human factors for flightcrew members and others.

6. THE MISSION OF DRM TRAINING. DRM training has been conceived to prevent aviation accidents by improving team performance through better team coordination.

7. BASIC CONCEPTS OF DRM.

a. Operating Environment. The operating environment comprises interactions of the aircraft dispatcher with:

(1) Pilots.

(2) Air traffic controllers.

(3) Other dispatchers.

(4) Managers.

(5) Station personnel.

(6) Meteorology resources.

(7) Aircraft maintenance staff.

(8) Load planners.

(9) Crew schedulers.

(10) Aircraft routers.

(11) Communication systems and related personnel.

(12) Flight planning systems and related personnel.

b. Situational Awareness (Dispatcher). The ability to absorb information in a dynamic environment, to evaluate and refine that information, to anticipate contingencies, and to initiate appropriate actions as necessary.

c. Communications. Chief among many functions, the dispatcher is a center for communications, continually receiving and disseminating information. He/she interfaces with the flightcrew, with ATC, and with many others in the operational environment. Communication skills are at the heart of this work. Communication should be in standardized language that is easily understood by individuals in various departments and joint

organizations. Communication among departments and joint training should be encouraged. Special emphasis should be given to:

(1) Inquiry/advocacy/assertion.

(2) Conflict resolution.

(3) Radio communication (phraseology and technique).

d. Handling Information. One of the aircraft dispatcher's main responsibilities is to keep the flightcrew updated on any information that affects flight safety. Dispatchers are required to review large quantities of real-time information and to decide what information is pertinent for each flight under their operational control. Dispatchers pass on information relevant to each flight, sometimes obtaining missing information as part of the process. This linkage provides timely information to the flightcrew members and relieves workload.

e. Interpersonal Skills. DRM concentrates on dispatchers' attitudes and behaviors and the effects that they have on others.

f. Workload Management. DRM should help dispatchers see that how they react during normal routine circumstances can have a powerful influence on how well they function during high workload and stressful situations. Prioritizing tasks is one key element in consistent, effective operational control.

g. Effective Decisionmaking. Through inquiry, advocacy, and assertion, the dispatcher assumes a leadership role within the operational environment. This leadership role in workload management and situational awareness supports the captain. It requires the dispatcher, together with the pilot in command, to apply problem solving skills which include the following:

(1) Weighing the competing needs that must be considered in choosing among alternatives.

(2) Being aware of the resources available to the various parties involved in the decisionmaking;

(3) Applying effective problem solving strategies to help in decisionmaking; and

(4) Avoiding situations and behaviors that contribute to errors.

8. FUNDAMENTALS OF DRM TRAINING IMPLEMENTATION. Research findings and airline operational experience suggest that the greatest benefits are achieved by adhering to the following practices:

a. Assess the Status of the Organization Before Implementation. It is important to know how widely DRM concepts are understood and practiced before designing specific training. Surveys of dispatchers, observation of dispatchers at work, and analysis of incident/accident reports can provide essential guidance for program designers.

b. Get Commitment from All Managers, Starting with Senior Managers. Resource management programs are received much more positively by operations personnel when senior managers, flight operations managers, and flight standards officers conspicuously support the basic concepts and provide the necessary resources for training. Training manuals should embrace DRM concepts by providing dispatchers with necessary policy and procedures guidance.

c. Customize the Training to Reflect the Nature and Needs of the Organization. Using knowledge of the state of the organization, priorities should be established for topics to be covered including special issues such as the effects of mergers or the introduction of advanced technology aircraft. This approach increases the relevance of training for dispatchers.

d. Define the Scope of the Program. Institute special DRM training for key personnel including developers/facilitators and supervisors. It is highly beneficial to provide training for these groups before beginning training for dispatchers. DRM training may later be expanded to include pilots, flight attendants, maintenance personnel, and other company resource groups as appropriate. It is also helpful to develop a long-term strategy for program implementation.

e. Communicate the Nature and Scope of the Program Before Startup. Training departments should provide dispatchers with a preview of what the training will involve together with plans for initial and continuing training. These steps can prevent misunderstandings about the focus of the training or any aspect of its implementation.

9. COMPONENTS OF DRM TRAINING.

a. Initial Indoctrination/Awareness.

(1) The initial indoctrination/awareness component of DRM training consists of classroom presentations that focus on the interpersonal relations and coordination involved in a decisionmaking process. It also provides a common terminology and conceptual framework for identifying coordination problems. Initial indoctrination may be accomplished by a combination of methods including lectures, discussion groups, and roleplaying exercises. It is advantageous to have interactive participation of flightcrew members and other members of the operating environment.

(2) Indoctrination/awareness training modules for experienced aircraft dispatchers are not the only way that this important DRM training component may be provided. DRM concepts should be addressed in dispatcher initial qualification training for new-hires. Initial qualification training, in turn, may be provided under conventional FAR Part 121 air carrier training programs or under the Advanced Qualification Program (AQP) detailed in SFAR No. 58.

(3) Curriculum development should address DRM skills that have been demonstrated to influence dispatcher performance. For maximum effectiveness, the curriculum should define the concepts involved and relate directly to operational issues which dispatchers face in daily operations.

b. Recurrent Practice and Feedback.

(1) DRM training should be included as a regular part of required recurrent training. Recurrent DRM training should include refresher practice and feedback exercises. An excellent training opportunity is line-oriented flight training (LOFT) with taped feedback, expanded to include the carrier's own aircraft dispatchers. A suitable LOFT substitute specifically for dispatchers might be even more valuable, in which dispatchers interact with several simulated flights at once.

(2) Recurrent training allows participants to practice newly improved skills in communication and interpersonal relationships and to receive feedback on their effectiveness. Feedback has its greatest impact when it comes by way of self-critique and peer review. Guidance from a facilitator with special training in assessment and debriefing techniques completes an effective practice/feedback process.

(3) Effective feedback refers to the coordination concepts identified in indoctrination/awareness training and relates to specific behaviors. Practice and feedback are best accomplished through the use of some form of simulation and audio- or videotape. Taped feedback, with the guidance of a facilitator, is particularly effective because it allows participants to view themselves from a third person perspective. This view is especially compelling in that strengths and weaknesses are captured on tape and vividly displayed. Stop action, replay, and slow motion are some of the playback features available during debriefing. Behaviors are easily seen, and appropriate adjustments are often self-evident.

c. Continuing Reinforcement. DRM concepts should be carried into every other type of training including technical and interdepartmental training so that those concepts are reinforced continuously.

(1) Technical training (e.g., initial and recurrent training).

(i) Simulation.

(ii) Case studies.

(2) Interdepartmental training (e.g., symposiums and seminars).

(i) Problem solving.

(ii) Stress awareness.

(iii) Role reversal.

(iv) Inquiry/advocacy/assertion.

(v) Conflict resolution.

d. Effective resource management skills are not gained by passively listening to classroom lectures, but by active participation and practice, including the use of simulators. Video feedback during debriefing following simulations should be provided so that dispatchers may assess their skills not only as individuals but as integral parts of the operating environment.

e. The uneasiness sometimes created by the presence of videotaping equipment may be relieved by bulk-erasing each videotape in the presence of the dispatcher at the end of the debriefing.

10. ASSESSMENT IN DRM TRAINING PROGRAMS.

a. Self. Developers/facilitators should use every available opportunity to highlight the importance of dispatcher coordination skills and techniques. One of the best learning opportunities occurs when dispatchers examine their own behavior and performance with the assistance of a trained facilitator. The facilitator points out both positive and negative aspects of DRM performance. Whenever highly effective performance is observed, it is vital that the underlying behaviors are discussed and reinforced.

b. Group/Program. DRM training is a dynamic process that works best when it is continually assessed against its goals. Each organization should design a systematic assessment program to track the effects of its training program and to make continuous program adjustments. Experience has shown that resource management training works best if it is continually refreshed by subject matter that is timely, relevant, and usable. Assessment of the training program may include observation of the training process and reports by the participants themselves.

11. THE CRITICAL ROLE OF THE DEVELOPER/FACILITATOR. The effectiveness of any training curriculum is directly related to the expertise of developers and facilitators. Ideally, developers and facilitators should be current, qualified dispatchers who have additional training in one of the following DRM/CRM topics:

a. Listening and communicating.

b. Roleplaying, simulations, and group discussions.

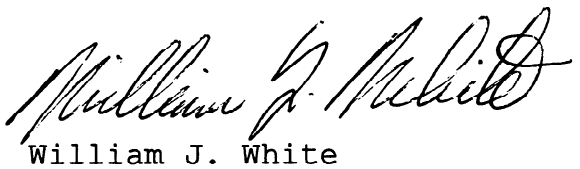
c. Debriefing and feedback.

12. EVOLVING CONCEPTS OF DRM.

a. Concurrent Training. More and more carriers are discovering the value of extending resource management training across organizational lines. Just as the aircraft dispatcher is a resource to the pilot, the pilot is a resource to the dispatcher. Similarly, other groups are resources to the pilot, to the aircraft dispatcher, and to each other. Concurrent training of pilots, flight attendants, aircraft dispatchers, and air traffic controllers has already been tried and found to be valuable. Some carriers include middle and upper-level managers. Their objective is to improve the effectiveness of all the groups within the operations team.

b. National Repository. A frequent recommendation has been that the FAA, airlines, and appropriate professional groups cooperate to develop a national repository of training reference materials relating to communication and other team coordination issues. Access to such materials should be provided to everyone in the aviation community upon request. Initiatives have begun that may provide this capability.

13. SUMMARY STATEMENT. Effective dispatch resource management begins in initial training; it is strengthened by recurrent practice and feedback; and it is sustained by continuing reinforcement that is part of the corporate culture and embedded in every element of a dispatcher's training.



William J. White
Deputy Director, Flight Standards Service

U.S. Department
of Transportation

**Federal Aviation
Administration**

800 Independence Ave., S.W.
Washington, D.C. 20591

**FORWARDING AND RETURN
POSTAGE GUARANTEED**

Official Business
Penalty for Private Use $300

BULK MAIL
POSTAGE & FEES PAID
FEDERAL AVIATION
ADMINISTRATION
PERMIT NO. G-44